

July 3, 2012

**RECEIVED**

Mr. Jason Gunter  
Remedial Project Manager  
U.S. Environmental Protection Agency  
Region 7 - Superfund Branch  
901 North 5<sup>th</sup> Street  
Kansas City, KS 66101

JUL 06 2012

**SUPERFUND DIVISION**

**Re: The Doe Run Company - Leadwood Mine Tailings Site Monthly Progress Report**

Dear Mr. Gunter:

As required by Article VI, Section 50 of the Unilateral Administrative Order (Docket No. CERCLA-07-2006-0272) for the referenced project and on behalf of The Doe Run Company, the progress report for the period May 1, 2012 through May 31, 2012 is enclosed. If you have any questions or comments, please call me at 573-638-5020 or Mark Nations at 573-518-0800.

Sincerely,



T.L. Morris, P.E., R.G.  
Vice President

TLM/jms  
Enclosures  
c: Mark Nations – TDRC  
Matt Wohl – TDRC (electronic only)  
Kathy Rangen – MDNR  
Tim Skoglund – Barr Engineering

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Superfund

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**Leadwood Mine Tailings Site**  
Leadwood, Missouri  
**Removal Action - Monthly Progress Report**  
Period: May 1, 2012 – May 31, 2012

**1. Actions Performed or Completed This Period:**

- a. No activities were completed at the site during this period.

**2. Data and Results Received This Period:**

- a. During this period, water samples were collected from downstream of Leadwood Dam and the East Seep and Erosion Area, as well as from upstream and downstream of the confluence of Eaton Creek with Big River. The analytical results for this event are included with this progress report.
- b. During this period, the Ambient Air Monitoring Report for February 2012 was received. Any issues identified in this report are discussed below. A copy of this document has been sent to your attention. The February 2012 Ambient Air Monitoring Report noted the following:
  - The action levels for lead and dust were not exceeded.

**3. Scheduled Activities not Completed This Period:**

- a. None.

**4. Planned Activities for Next Period:**

- a. Continue vegetation maintenance activities. The use of biosolids will only be continued if a biosolids management plan has been submitted to and approved by EPA.
- b. It is anticipated that EPA will use this site as a soil repository in the future. Preparations for these activities will continue.
- c. Complete monthly water sampling activities as described in the Removal Action Work Plan.
- d. Complete air monitoring activities as described in the Removal Action Work Plan.

**5. Changes in Personnel:**

- a. None.

**6. Issues or Problems Arising This Period:**

- a. None.

**7. Resolution of Issues or Problems Arising This Period:**

- a. None.

**End of Monthly Progress Report**

June 18, 2012

Allison Olds  
Barr Engineering Company  
1001 Diamond Ridge  
Suite 1100  
Jefferson City, MO 65109  
TEL: (573) 638-5007  
FAX: (573) 638-5001



**RE: Leadwood MTS-25/86-0013**

**WorkOrder: 12060017**

Dear Allison Olds:

TEKLAB, INC received 8 samples on 6/1/2012 11:00:00 AM for the analysis presented in the following report.

Samples are analyzed on an as received basis unless otherwise requested and documented. The sample results contained in this report relate only to the requested analytes of interest as directed on the chain of custody. NELAP accredited fields of testing are indicated by the letters NELAP under the Certification column. Unless otherwise documented within this report, Teklab Inc. analyzes samples utilizing the most current methods in compliance with 40CFR. All tests are performed in the Collinsville, IL laboratory unless otherwise noted in the Case Narrative.

All quality control criteria applicable to the test methods employed for this project have been satisfactorily met and are in accordance with NELAP except where noted. The following report shall not be reproduced, except in full, without the written approval of Teklab, Inc.

If you have any questions regarding these tests results, please feel free to call.

Sincerely,



Michael L. Austin  
Project Manager  
(618)344-1004 ex 16  
[MAustin@teklabinc.com](mailto:MAustin@teklabinc.com)



## Report Contents

<http://www.teklabinc.com/>

**Client:** Barr Engineering Company

**Client Project:** Leadwood MTS-25/86-0013

**Work Order:** 12060017

**Report Date:** 18-Jun-12

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## Definitions

<http://www.teklabinc.com/>

**Client:** Barr Engineering Company  
**Client Project:** Leadwood MTS-25/86-0013

**Work Order:** 12060017  
**Report Date:** 18-Jun-12

### Abbr Definition

- CCV** Continuing calibration verification is a check of a standard to determine the state of calibration of an instrument between recalibration.
- DF** Dilution factor is the dilution performed during analysis only and does not take into account any dilutions made during sample preparation. The reported result is final and includes all dilutions factors.
- DNI** Did not ignite
- DUP** Laboratory duplicate is an aliquot of a sample taken from the same container under laboratory conditions for independent processing and analysis independently of the original aliquot.
- ICV** Initial calibration verification is a check of a standard to determine the state of calibration of an instrument before sample analysis is initiated.
- IDPH** IL Dept. of Public Health
- LCS** Laboratory control sample, spiked with verified known amounts of analytes, is analyzed exactly like a sample to establish intra-laboratory or analyst specific precision and bias or to assess the performance of all or a portion of the measurement system. The acceptable recovery range is in the QC Package (provided upon request).
- LCSD** Laboratory control sample duplicate is a replicate laboratory control sample that is prepared and analyzed in order to determine the precision of the approved test method. The acceptable recovery range is listed in the QC Package (provided upon request).
- MB** Method blank is a sample of a matrix similar to the batch of associated sample (when available) that is free from the analytes of interest and is processed simultaneously with and under the same conditions as samples through all steps of the analytical procedures, and in which no target analytes or interferences should present at concentrations that impact the analytical results for sample analyses.
- MDL** Method detection limit means the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix type containing the analyte.
- MS** Matrix spike is an aliquot of matrix fortified (spiked) with known quantities of specific analytes that is subjected to the entire analytical procedures in order to determine the effect of the matrix on an approved test method's recovery system. The acceptable recovery range is listed in the QC Package (provided upon request).
- MSD** Matrix spike duplicate means a replicate matrix spike that is prepared and analyzed in order to determine the precision of the approved test method. The acceptable recovery range is listed in the QC Package (provided upon request).
- MW** Molecular weight
- ND** Not Detected at the Reporting Limit
- NELAP** NELAP Accredited
- PQL** Practical quantitation limit means the lowest level that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operation conditions. The acceptable recovery range is listed in the QC Package (provided upon request).
- RL** The reporting limit the lowest level that the data is displayed in the final report. The reporting limit may vary according to customer request or sample dilution. The reporting limit may not be less than the MDL.
- RPD** Relative percent difference is a calculated difference between two recoveries (ie. MS/MSD). The acceptable recovery limit is listed in the QC Package (provided upon request).
- SPK** The spike is a known mass of target analyte added to a blank sample or sub-sample; used to determine recovery deficiency or for other quality control purposes.
- Sur** Surrogates are compounds which are similar to the analytes of interest in chemical composition and behavior in the analytical process, but which are not normally found in environmental samples.
- TNTC** Too numerous to count (> 200 CFU )

### Qualifiers

- |  |   |
|--|---|
| # - Unknown hydrocarbon                                | B - Analyte detected in associated Method Blank |
| E - Value above quantitation range                     | H - Holding times exceeded                      |
| M - Manual Integration used to determine area response | ND - Not Detected at the Reporting Limit        |
| R - RPD outside accepted recovery limits               | S - Spike Recovery outside recovery limits      |
| X - Value exceeds Maximum Contaminant Level            |   |



## Case Narrative

<http://www.teklabinc.com/>

**Client:** Barr Engineering Company

**Work Order:** 12060017

**Client Project:** Leadwood MTS-25/86-0013

**Report Date:** 18-Jun-12

**Cooler Receipt Temp:** 0.6 °C

The Total and Dissolved results for ICP metals were not representative of historical data on sample LW-001. The dissolved results were significantly higher than the total results. The sample was analyzed several times using the following:

12060017-001C Total Metals as received with Nitric Acid.

12060017-001D Dissolved Metals as received filtered with Nitric Acid.

12060017-006A Total Metals analyzed straight from the unfiltered Nitric Acid bottle. No prep procedure was used.

12060017-006B Dissolved Metals analyzed straight from the filtered Nitric Acid bottle. No prep procedure was used.

12060017-007A Duplicate of sample 12060017-006A.

12060017-007B Duplicate of sample 12060017-006B.

12060017-008A A portion of the unpreserved bottle was digested and analyzed for Total Metals.

12060017-008B A portion of the unpreserved bottle was filtered, digested, and analyzed for Dissolved Metals.

### Locations and Accreditations

Collinsville		Springfield		Kansas City	
Address	5445 Horseshoe Lake Road Collinsville, IL 62234-7425	Address	3920 Pintail Dr Springfield, IL 62711-9415	Address	8421 Nieman Road Lenexa, KS 66214
Phone	(618) 344-1004	Phone	(217) 698-1004	Phone	(913) 541-1998
Fax	(618) 344-1005	Fax	(217) 698-1005	Fax	(913) 541-1998
Email	jhriley@teklabinc.com	Email	kmcclain@teklabinc.com	Email	dthompson@teklabinc.com

State	Dept	Cert #	NELAP	Exp Date	Lab
Illinois	IEPA	100226	NELAP	1/31/2013	Collinsville
Kansas	KDHE	E-10374	NELAP	1/31/2013	Collinsville
Louisiana	LDEQ	166493	NELAP	6/30/2012	Collinsville
Louisiana	LDEQ	166578	NELAP	6/30/2012	Springfield
Arkansas	ADEQ	88-0966		3/14/2013	Collinsville
Illinois	IDPH	17584		4/30/2013	Collinsville
Kentucky	UST	0073		5/26/2014	Collinsville
Missouri	MDNR	00930		4/13/2013	Collinsville
Oklahoma	ODEQ	9978		8/31/2012	Collinsville

# Laboratory Results

<http://www.teklabinc.com/>
**Client:** Barr Engineering Company

**Work Order:** 12060017

**Client Project:** Leadwood MTS-25/86-0013

**Report Date:** 18-Jun-12

**Lab ID:** 12060017-001

**Client Sample ID:** LW-001

**Matrix:** AQUEOUS

**Collection Date:** 05/31/2012 13:20

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
<b>EPA 600 375.2 REV 2.0 1993 (TOTAL)</b>								
Sulfate	NELAP	200		451	mg/L	20	06/05/2012 13:05	R164431
<b>STANDARD METHOD 18TH ED. 4500-H B, LABORATORY ANALYZED</b>								
Lab pH	NELAP	1.00		8.03		1	06/01/2012 12:19	R164284
<b>STANDARD METHODS 18TH ED. 2340 C</b>								
Hardness, as ( CaCO <sub>3</sub> )	NELAP	5		780	mg/L	1	06/01/2012 12:20	R164298
<b>STANDARD METHODS 18TH ED. 2540 D</b>								
Total Suspended Solids	NELAP	6		< 6	mg/L	1	06/01/2012 12:53	R164280
<b>STANDARD METHODS 18TH ED. 2540 F</b>								
Solids, Settleable	NELAP	0.1		< 0.1	ml/L	1	06/01/2012 12:11	R164275
<b>STANDARD METHODS 18TH ED. 5310 C, ORGANIC CARBON</b>								
Total Organic Carbon (TOC)	NELAP	1.0		2.8	mg/L	1	06/04/2012 19:09	R164375
<b>EPA 600 4.1.1, 200.7R4.4, METALS BY ICP (DISSOLVED)</b>								
Cadmium	NELAP	2.00		3.10	µg/L	1	06/05/2012 7:02	78596
Zinc	NELAP	10.0		2850	µg/L	1	06/05/2012 7:02	78596
<b>EPA 600 4.1.4, 200.7R4.4, METALS BY ICP (TOTAL)</b>								
Cadmium	NELAP	2.00		2.30	µg/L	1	06/05/2012 2:15	78614
Zinc	NELAP	10.0		1980	µg/L	1	06/05/2012 2:15	78614
<b>STANDARD METHODS 18TH ED. 3030 B, 3113 B, METALS BY GFAA (DISSOLVED)</b>								
Lead	NELAP	2.00	X	6.52	µg/L	1	06/01/2012 13:27	78595
<b>STANDARD METHODS 18TH ED. 3030 E, 3113 B, METALS BY GFAA</b>								
Lead	NELAP	2.00	X	21.2	µg/L	1	06/04/2012 10:23	78613



## Laboratory Results

<http://www.teklabinc.com/>

**Client:** Barr Engineering Company

**Work Order:** 12060017

**Client Project:** Leadwood MTS-25/86-0013

**Report Date:** 18-Jun-12

**Lab ID:** 12060017-002

**Client Sample ID:** LW-002

**Matrix:** AQUEOUS

**Collection Date:** 05/31/2012 12:35

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
<b>EPA 600 375.2 REV 2.0 1993 (TOTAL)</b>								
Sulfate	NELAP	200		500	mg/L	20	06/05/2012 13:07	R164431
<b>STANDARD METHOD 18TH ED. 4500-H B, LABORATORY ANALYZED</b>								
Lab pH	NELAP	1.00		7.83		1	06/01/2012 12:20	R164284
<b>STANDARD METHODS 18TH ED. 2340 C</b>								
Hardness, as ( CaCO <sub>3</sub> )	NELAP	5		820	mg/L	1	06/01/2012 12:20	R164298
<b>STANDARD METHODS 18TH ED. 2540 D</b>								
Total Suspended Solids	NELAP	6		7	mg/L	1	06/01/2012 12:53	R164280
<b>STANDARD METHODS 18TH ED. 2540 F</b>								
Solids, Settleable	NELAP	0.1		< 0.1	ml/L	1	06/01/2012 12:11	R164275
<b>STANDARD METHODS 18TH ED. 5310 C, ORGANIC CARBON</b>								
Total Organic Carbon (TOC)	NELAP	1.0		3.5	mg/L	1	06/04/2012 19:36	R164375
<b>EPA 600 4.1.1, 200.7R4.4, METALS BY ICP (DISSOLVED)</b>								
Cadmium	NELAP	2.00		< 2.00	µg/L	1	06/05/2012 7:08	78596
Zinc	NELAP	10.0		2800	µg/L	1	06/05/2012 7:08	78596
<b>EPA 600 4.1.4, 200.7R4.4, METALS BY ICP (TOTAL)</b>								
Cadmium	NELAP	2.00		3.50	µg/L	1	06/05/2012 2:21	78614
Zinc	NELAP	10.0		3380	µg/L	1	06/05/2012 2:21	78614
<b>STANDARD METHODS 18TH ED. 3030 B, 3113 B, METALS BY GFAA (DISSOLVED)</b>								
Lead	NELAP	2.00	X	8.50	µg/L	1	06/01/2012 13:37	78595
<b>STANDARD METHODS 18TH ED. 3030 E, 3113 B, METALS BY GFAA</b>								
Lead	NELAP	2.00	X	21.8	µg/L	1	06/04/2012 10:33	78613



## Laboratory Results

<http://www.teklabinc.com/>

**Client:** Barr Engineering Company  
**Client Project:** Leadwood MTS-25/86-0013  
**Lab ID:** 12060017-003  
**Matrix:** AQUEOUS

**Work Order:** 12060017  
**Report Date:** 18-Jun-12

**Client Sample ID:** LW-Dup

**Collection Date:** 05/31/2012 12:45

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
<b>EPA 600 375.2 REV 2.0 1993 (TOTAL)</b>								
Sulfate	NELAP	100		492	mg/L	10	06/05/2012 13:18	R164431
<b>STANDARD METHOD 18TH ED. 4500-H B, LABORATORY ANALYZED</b>								
Lab pH	NELAP	1.00		7.84		1	06/01/2012 12:23	R164284
<b>STANDARD METHODS 18TH ED. 2340 C</b>								
Hardness, as ( CaCO <sub>3</sub> )	NELAP	5		800	mg/L	1	06/01/2012 12:20	R164298
<b>STANDARD METHODS 18TH ED. 2540 D</b>								
Total Suspended Solids	NELAP	6		< 6	mg/L	1	06/01/2012 12:53	R164280
<b>STANDARD METHODS 18TH ED. 2540 F</b>								
Solids, Settleable	NELAP	0.1		< 0.1	ml/L	1	06/01/2012 12:11	R164275
<b>STANDARD METHODS 18TH ED. 5310 C, ORGANIC CARBON</b>								
Total Organic Carbon (TOC)	NELAP	1.0		3.0	mg/L	1	06/04/2012 19:42	R164375
<b>EPA 600 4.1.1, 200.7R4.4, METALS BY ICP (DISSOLVED)</b>								
Cadmium	NELAP	2.00		< 2.00	µg/L	1	06/05/2012 7:26	78596
Zinc	NELAP	10.0		2810	µg/L	1	06/05/2012 7:26	78596
<b>EPA 600 4.1.4, 200.7R4.4, METALS BY ICP (TOTAL)</b>								
Cadmium	NELAP	2.00		3.40	µg/L	1	06/05/2012 2:38	78614
Zinc	NELAP	10.0		3360	µg/L	1	06/05/2012 2:38	78614
<b>STANDARD METHODS 18TH ED. 3030 B, 3113 B, METALS BY GFAA (DISSOLVED)</b>								
Lead	NELAP	2.00	X	8.46	µg/L	1	06/01/2012 13:41	78595
<b>STANDARD METHODS 18TH ED. 3030 E, 3113 B, METALS BY GFAA</b>								
Lead	NELAP	2.00	X	23.1	µg/L	1	06/04/2012 10:36	78613



## Laboratory Results

<http://www.teklabinc.com/>

Client: Barr Engineering Company

Work Order: 12060017

Client Project: Leadwood MTS-25/86-0013

Report Date: 18-Jun-12

Lab ID: 12060017-004

Client Sample ID: LW-DS

Matrix: AQUEOUS

Collection Date: 05/31/2012 9:50

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
<b>EPA 600 375.2 REV 2.0 1993 (TOTAL)</b>								
Sulfate	NELAP	50	S	62	mg/L	5	06/06/2012 15:22	R164443
<i>Sample concentration was greater than 5 times the spike concentration.</i>								
<b>STANDARD METHOD 18TH ED. 4500-H B, LABORATORY ANALYZED</b>								
Lab pH	NELAP	1.00		7.82		1	06/01/2012 12:25	R164284
<b>STANDARD METHODS 18TH ED. 2340 C</b>								
Hardness, as ( CaCO <sub>3</sub> )	NELAP	5		300	mg/L	1	06/01/2012 12:20	R164298
<b>STANDARD METHODS 18TH ED. 2540 D</b>								
Total Suspended Solids	NELAP	6		6	mg/L	1	06/01/2012 12:53	R164280
<b>STANDARD METHODS 18TH ED. 5310 C, ORGANIC CARBON</b>								
Total Organic Carbon (TOC)	NELAP	1.0		1.8	mg/L	1	06/04/2012 19:48	R164375
<b>EPA 600 4.1.1, 200.7R4.4, METALS BY ICP (DISSOLVED)</b>								
Cadmium	NELAP	2.00		< 2.00	µg/L	1	06/05/2012 7:32	78596
Zinc	NELAP	10.0		< 10.0	µg/L	1	06/05/2012 7:32	78596
<b>EPA 600 4.1.4, 200.7R4.4, METALS BY ICP (TOTAL)</b>								
Cadmium	NELAP	2.00		< 2.00	µg/L	1	06/05/2012 2:44	78614
Zinc	NELAP	10.0		16.6	µg/L	1	06/05/2012 2:44	78614
<b>STANDARD METHODS 18TH ED. 3030 B, 3113 B, METALS BY GFAA (DISSOLVED)</b>								
Lead	NELAP	2.00		< 2.00	µg/L	1	06/01/2012 13:44	78595
<b>STANDARD METHODS 18TH ED. 3030 E, 3113 B, METALS BY GFAA</b>								
Lead	NELAP	2.00		4.05	µg/L	1	06/04/2012 10:40	78613



## Laboratory Results

<http://www.teklabinc.com/>

**Client:** Barr Engineering Company

**Work Order:** 12060017

**Client Project:** Leadwood MTS-25/86-0013

**Report Date:** 18-Jun-12

**Lab ID:** 12060017-005

**Client Sample ID:** LW-US

**Matrix:** AQUEOUS

**Collection Date:** 05/31/2012 9:30

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
<b>EPA 600 375.2 REV 2.0 1993 (TOTAL)</b>								
Sulfate	NELAP	10		31	mg/L	1	06/05/2012 13:31	R164431
<b>STANDARD METHOD 18TH ED. 4500-H B, LABORATORY ANALYZED</b>								
Lab pH	NELAP	1.00		7.77		1	06/01/2012 12:27	R164284
<b>STANDARD METHODS 18TH ED. 2340 C</b>								
Hardness, as ( CaCO <sub>3</sub> )	NELAP	5		300	mg/L	1	06/01/2012 12:20	R164298
<b>STANDARD METHODS 18TH ED. 2540 D</b>								
Total Suspended Solids	NELAP	6		< 6	mg/L	1	06/01/2012 12:53	R164280
<b>STANDARD METHODS 18TH ED. 5310 C, ORGANIC CARBON</b>								
Total Organic Carbon (TOC)	NELAP	1.0		1.7	mg/L	1	06/04/2012 20:39	R164375
<b>EPA 600 4.1.1, 200.7R4.4, METALS BY ICP (DISSOLVED)</b>								
Cadmium	NELAP	2.00		< 2.00	µg/L	1	06/05/2012 7:50	78596
Zinc	NELAP	10.0		< 10.0	µg/L	1	06/05/2012 7:50	78596
<b>EPA 600 4.1.4, 200.7R4.4, METALS BY ICP (TOTAL)</b>								
Cadmium	NELAP	2.00		< 2.00	µg/L	1	06/05/2012 2:50	78614
Zinc	NELAP	10.0		< 10.0	µg/L	1	06/05/2012 2:50	78614
<b>STANDARD METHODS 18TH ED. 3030 B, 3113 B, METALS BY GFAA (DISSOLVED)</b>								
Lead	NELAP	2.00		< 2.00	µg/L	1	06/01/2012 13:47	78595
<b>STANDARD METHODS 18TH ED. 3030 E, 3113 B, METALS BY GFAA</b>								
Lead	NELAP	2.00		< 2.00	µg/L	1	06/04/2012 10:43	78613



## Laboratory Results

<http://www.teklabinc.com/>

**Client:** Barr Engineering Company

**Work Order:** 12060017

**Client Project:** Leadwood MTS-25/86-0013

**Report Date:** 18-Jun-12

**Lab ID:** 12060017-006

**Client Sample ID:** LW-001 HNO3 Non-digested

**Matrix:** AQUEOUS

**Collection Date:** 05/31/2012 13:20

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
<b>EPA 600 4.1.1, 200.7R4.4, METALS BY ICP (DISSOLVED)</b>								
Cadmium	NELAP	2.00		3.30	µg/L	1	06/08/2012 0:00	R164532
Zinc	NELAP	10.0		3150	µg/L	1	06/08/2012 0:00	R164532
<b>EPA 600 4.1.4, 200.7R4.4, METALS BY ICP (TOTAL)</b>								
Cadmium	NELAP	2.00		2.40	µg/L	1	06/08/2012 0:00	R164532
Zinc	NELAP	10.0		2130	µg/L	1	06/08/2012 0:00	R164532



## Laboratory Results

<http://www.teklabinc.com/>

**Client:** Barr Engineering Company

**Work Order:** 12060017

**Client Project:** Leadwood MTS-25/86-0013

**Report Date:** 18-Jun-12

**Lab ID:** 12060017-007

**Client Sample ID:** LW-001 HNO<sub>3</sub> Non-digested DUP

**Matrix:** AQUEOUS

**Collection Date:** 05/31/2012 13:20

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
<b>EPA 600 4.1.1, 200.7R4.4, METALS BY ICP (DISSOLVED)</b>								
Cadmium	NELAP	2.00		3.30	µg/L	1	06/08/2012 0:00	R164532
Zinc	NELAP	10.0		3120	µg/L	1	06/08/2012 0:00	R164532
<b>EPA 600 4.1.4, 200.7R4.4, METALS BY ICP (TOTAL)</b>								
Cadmium	NELAP	2.00		2.30	µg/L	1	06/08/2012 0:00	R164532
Zinc	NELAP	10.0		2110	µg/L	1	06/08/2012 0:00	R164532



## Laboratory Results

<http://www.teklabinc.com/>

**Client:** Barr Engineering Company

**Work Order:** 12060017

**Client Project:** Leadwood MTS-25/86-0013

**Report Date:** 18-Jun-12

**Lab ID:** 12060017-008

**Client Sample ID:** LW-001 Unpreserved Bottle

**Matrix:** AQUEOUS

**Collection Date:** 05/31/2012 13:20

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
<b>EPA 600 4.1.1, 200.7R4.4, METALS BY ICP (DISSOLVED)</b>								
Cadmium	NELAP	2.00		3.00	µg/L	1	06/12/2012 15:04	78884
Zinc	NELAP	10.0		2880	µg/L	1	06/12/2012 15:04	78884
<b>EPA 600 4.1.4, 200.7R4.4, METALS BY ICP (TOTAL)</b>								
Cadmium	NELAP	2.00		3.20	µg/L	1	06/12/2012 14:35	78881
Zinc	NELAP	10.0		3060	µg/L	1	06/12/2012 14:35	78881
<b>STANDARD METHODS 18TH ED. 3030 B, 3113 B, METALS BY GFAA (DISSOLVED)</b>								
Lead	NELAP	2.00	X	5.74	µg/L	1	06/12/2012 9:42	78883
<b>STANDARD METHODS 18TH ED. 3030 E, 3113 B, METALS BY GFAA</b>								
Lead	NELAP	2.00	X	8.46	µg/L	1	06/12/2012 14:08	78880



## Sample Summary

<http://www.teklabinc.com/>

**Client:** Barr Engineering Company

**Client Project:** Leadwood MTS-25/86-0013

**Work Order:** 12060017

**Report Date:** 18-Jun-12

Lab Sample ID	Client Sample ID	Matrix	Fractions	Collection Date
12060017-001	LW-001	Aqueous	7	05/31/2012 13:20
12060017-002	LW-002	Aqueous	5	05/31/2012 12:35
12060017-003	LW-Dup	Aqueous	5	05/31/2012 12:45
12060017-004	LW-DS	Aqueous	5	05/31/2012 9:50
12060017-005	LW-US	Aqueous	5	05/31/2012 9:30
12060017-006	LW-001 HNO3 Non-digested	Aqueous	2	05/31/2012 13:20
12060017-007	LW-001 HNO3 Non-digested DUP	Aqueous	2	05/31/2012 13:20
12060017-008	LW-001 Unpreserved Bottle	Aqueous	2	05/31/2012 13:20

**Client:** Barr Engineering Company  
**Client Project:** Leadwood MTS-25/86-0013

**Work Order:** 12060017  
**Report Date:** 18-Jun-12

Sample ID	Client Sample ID	Collection Date	Received Date	Prep Date/Time	Analysis Date/Time
	Test Name				
12060017-001A	LW-001	05/31/2012 13:20	6/1/2012 11:00:00 AM		
	Standard Methods 18th Ed. 2540 F				06/01/2012 12:11
12060017-001B	LW-001	05/31/2012 13:20	6/1/2012 11:00:00 AM		
	EPA 600 375.2 Rev 2.0 1993 (Total)				06/05/2012 13:05
	Standard Method 18th Ed. 4500-H B, Laboratory Analyzed				06/01/2012 12:19
	Standard Methods 18th Ed. 2340 C				06/01/2012 12:20
	Standard Methods 18th Ed. 2540 D				06/01/2012 12:53
12060017-001C	LW-001	05/31/2012 13:20	6/1/2012 11:00:00 AM		
	EPA 600 4.1.4, 200.7R4.4, Metals by ICP (Total)				06/01/2012 17:19
	Standard Methods 18th Ed. 3030 E, 3113 B, Metals by GFAA				06/01/2012 16:48
12060017-001D	LW-001	05/31/2012 13:20	6/1/2012 11:00:00 AM		
	EPA 600 4.1.1, 200.7R4.4, Metals by ICP (Dissolved)				06/01/2012 12:45
	Standard Methods 18th Ed. 3030 B, 3113 B, Metals by GFAA (Dissolved)				06/01/2012 12:11
12060017-001E	LW-001	05/31/2012 13:20	6/1/2012 11:00:00 AM		
	Standard Methods 18th Ed. 5310 C, Organic Carbon				06/04/2012 19:09
12060017-001F	LW-001	05/31/2012 13:20	6/1/2012 11:00:00 AM		
	EPA 600 4.1.4, 200.7R4.4, Metals by ICP (Total)				06/12/2012 9:11
	Standard Methods 18th Ed. 3030 E, 3113 B, Metals by GFAA				06/12/2012 9:09
12060017-001G	LW-001	05/31/2012 13:20	6/1/2012 11:00:00 AM		
	EPA 600 4.1.1, 200.7R4.4, Metals by ICP (Dissolved)				06/12/2012 9:28
	Standard Methods 18th Ed. 3030 B, 3113 B, Metals by GFAA (Dissolved)				06/12/2012 9:21
12060017-002A	LW-002	05/31/2012 12:35	6/1/2012 11:00:00 AM		
	Standard Methods 18th Ed. 2540 F				06/01/2012 12:11
12060017-002B	LW-002	05/31/2012 12:35	6/1/2012 11:00:00 AM		
	EPA 600 375.2 Rev 2.0 1993 (Total)				06/05/2012 13:07
	Standard Method 18th Ed. 4500-H B, Laboratory Analyzed				06/01/2012 12:20
	Standard Methods 18th Ed. 2340 C				06/01/2012 12:20
	Standard Methods 18th Ed. 2540 D				06/01/2012 12:53
12060017-002C	LW-002	05/31/2012 12:35	6/1/2012 11:00:00 AM		
	EPA 600 4.1.4, 200.7R4.4, Metals by ICP (Total)				06/01/2012 17:19
	Standard Methods 18th Ed. 3030 E, 3113 B, Metals by GFAA				06/01/2012 16:56
12060017-002D	LW-002	05/31/2012 12:35	6/1/2012 11:00:00 AM		
	EPA 600 4.1.1, 200.7R4.4, Metals by ICP (Dissolved)				06/01/2012 12:45
	Standard Methods 18th Ed. 3030 B, 3113 B, Metals by GFAA (Dissolved)				06/01/2012 12:11
12060017-002E	LW-002	05/31/2012 12:35	6/1/2012 11:00:00 AM		
	Standard Methods 18th Ed. 5310 C, Organic Carbon				06/04/2012 19:36



## Dates Report

<http://www.teklabinc.com/>

**Client:** Barr Engineering Company  
**Client Project:** Leadwood MTS-25/86-0013

**Work Order:** 12060017  
**Report Date:** 18-Jun-12

Sample ID	Client Sample ID	Collection Date	Received Date	Prep Date/Time	Analysis Date/Time
	Test Name				
12060017-003A	LW-Dup	05/31/2012 12:45	6/1/2012 11:00:00 AM		
	Standard Methods 18th Ed. 2540 F				06/01/2012 12:11
12060017-003B	LW-Dup	05/31/2012 12:45	6/1/2012 11:00:00 AM		
	EPA 600 375.2 Rev 2.0 1993 (Total)				06/05/2012 13:18
	Standard Method 18th Ed. 4500-H B, Laboratory Analyzed				06/01/2012 12:23
	Standard Methods 18th Ed. 2340 C				06/01/2012 12:20
	Standard Methods 18th Ed. 2540 D				06/01/2012 12:53
12060017-003C	LW-Dup	05/31/2012 12:45	6/1/2012 11:00:00 AM		
	EPA 600 4.1.4, 200.7R4.4, Metals by ICP (Total)			06/01/2012 17:19	06/05/2012 2:38
	Standard Methods 18th Ed. 3030 E, 3113 B, Metals by GFAA			06/01/2012 16:56	06/04/2012 10:36
12060017-003D	LW-Dup	05/31/2012 12:45	6/1/2012 11:00:00 AM		
	EPA 600 4.1.1, 200.7R4.4, Metals by ICP (Dissolved)			06/01/2012 12:45	06/05/2012 7:26
	Standard Methods 18th Ed. 3030 B, 3113 B, Metals by GFAA (Dissolved)			06/01/2012 12:11	06/01/2012 13:41
12060017-003E	LW-Dup	05/31/2012 12:45	6/1/2012 11:00:00 AM		
	Standard Methods 18th Ed. 5310 C, Organic Carbon				06/04/2012 19:42
12060017-004A	LW-DS	05/31/2012 9:50	6/1/2012 11:00:00 AM		
	Standard Method 18th Ed. 4500-H B, Laboratory Analyzed				06/01/2012 12:25
	Standard Methods 18th Ed. 2540 D				06/01/2012 12:53
12060017-004B	LW-DS	05/31/2012 9:50	6/1/2012 11:00:00 AM		
	EPA 600 375.2 Rev 2.0 1993 (Total)				06/06/2012 15:22
	Standard Methods 18th Ed. 2340 C				06/01/2012 12:20
12060017-004C	LW-DS	05/31/2012 9:50	6/1/2012 11:00:00 AM		
	EPA 600 4.1.4, 200.7R4.4, Metals by ICP (Total)			06/01/2012 17:19	06/05/2012 2:44
	Standard Methods 18th Ed. 3030 E, 3113 B, Metals by GFAA			06/01/2012 16:56	06/04/2012 10:40
12060017-004D	LW-DS	05/31/2012 9:50	6/1/2012 11:00:00 AM		
	EPA 600 4.1.1, 200.7R4.4, Metals by ICP (Dissolved)			06/01/2012 12:45	06/05/2012 7:32
	Standard Methods 18th Ed. 3030 B, 3113 B, Metals by GFAA (Dissolved)			06/01/2012 12:11	06/01/2012 13:44
12060017-004E	LW-DS	05/31/2012 9:50	6/1/2012 11:00:00 AM		
	Standard Methods 18th Ed. 5310 C, Organic Carbon				06/04/2012 19:48
12060017-005A	LW-US	05/31/2012 9:30	6/1/2012 11:00:00 AM		
	Standard Method 18th Ed. 4500-H B, Laboratory Analyzed				06/01/2012 12:27
	Standard Methods 18th Ed. 2540 D				06/01/2012 12:53
12060017-005B	LW-US	05/31/2012 9:30	6/1/2012 11:00:00 AM		
	EPA 600 375.2 Rev 2.0 1993 (Total)				06/05/2012 13:31
	Standard Methods 18th Ed. 2340 C				06/01/2012 12:20
12060017-005C	LW-US	05/31/2012 9:30	6/1/2012 11:00:00 AM		



## Dates Report

<http://www.teklabinc.com/>

**Client:** Barr Engineering Company

**Client Project:** Leadwood MTS-25/86-0013

**Work Order:** 12060017

**Report Date:** 18-Jun-12

Sample ID	Client Sample ID	Collection Date	Received Date	Prep Date/Time	Analysis Date/Time
	Test Name				
	EPA 600 4.1.4, 200.7R4.4, Metals by ICP (Total)		06/01/2012 17:19		06/05/2012 2:50
	Standard Methods 18th Ed. 3030 E, 3113 B, Metals by GFAA		06/01/2012 16:56		06/04/2012 10:43
12060017-005D	LW-US	05/31/2012 9:30	6/1/2012 11:00:00 AM		
	EPA 600 4.1.1, 200.7R4.4, Metals by ICP (Dissolved)		06/01/2012 12:45		06/05/2012 7:50
	Standard Methods 18th Ed. 3030 B, 3113 B, Metals by GFAA (Dissolved)		06/01/2012 12:11		06/01/2012 13:47
12060017-005E	LW-US	05/31/2012 9:30	6/1/2012 11:00:00 AM		
	Standard Methods 18th Ed. 5310 C, Organic Carbon				06/04/2012 20:39
12060017-006A	LW-001 HNO3 Non-digested	05/31/2012 13:20	6/1/2012 11:00:00 AM		
	EPA 600 4.1.4, 200.7R4.4, Metals by ICP (Total)				06/08/2012 0:00
12060017-006B	LW-001 HNO3 Non-digested	05/31/2012 13:20	6/1/2012 11:00:00 AM		
	EPA 600 4.1.1, 200.7R4.4, Metals by ICP (Dissolved)				06/08/2012 0:00
12060017-007A	LW-001 HNO3 Non-digested DUP	05/31/2012 13:20	6/1/2012 11:00:00 AM		
	EPA 600 4.1.4, 200.7R4.4, Metals by ICP (Total)				06/08/2012 0:00
12060017-007B	LW-001 HNO3 Non-digested DUP	05/31/2012 13:20	6/1/2012 11:00:00 AM		
	EPA 600 4.1.1, 200.7R4.4, Metals by ICP (Dissolved)				06/08/2012 0:00
12060017-008A	LW-001 Unpreserved Bottle	05/31/2012 13:20	6/1/2012 11:00:00 AM		
	EPA 600 4.1.4, 200.7R4.4, Metals by ICP (Total)		06/12/2012 9:11		06/12/2012 14:35
	Standard Methods 18th Ed. 3030 E, 3113 B, Metals by GFAA		06/12/2012 9:09		06/12/2012 14:08
12060017-008B	LW-001 Unpreserved Bottle	05/31/2012 13:20	6/1/2012 11:00:00 AM		
	EPA 600 4.1.1, 200.7R4.4, Metals by ICP (Dissolved)		06/12/2012 9:28		06/12/2012 15:04
	Standard Methods 18th Ed. 3030 B, 3113 B, Metals by GFAA (Dissolved)		06/12/2012 9:21		06/12/2012 9:42



## Quality Control Results

<http://www.teklabinc.com/>

**Client:** Barr Engineering Company

**Client Project:** Leadwood MTS-25/86-0013

**Work Order:** 12060017

**Report Date:** 18-Jun-12

### EPA 600 375.2 REV 2.0 1993 (TOTAL)

**Batch R164431 SampType: MBLK Units mg/L**

SampID: ICB/MBLK

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Sulfate	10		< 10						06/05/2012

**Batch R164431 SampType: LCS Units mg/L**

SampID: ICV/LCS

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Sulfate	10		20	20	0	99.8	90	110	06/05/2012

**Batch R164443 SampType: MBLK Units mg/L**

SampID: CCB

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Sulfate	10		< 10						06/07/2012

**Batch R164443 SampType: MBLK Units mg/L**

SampID: ICB/MBLK

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Sulfate	10		< 10						06/06/2012

**Batch R164443 SampType: LCS Units mg/L**

SampID: CCV

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Sulfate	10		20	20	0	99.6	90	110	06/07/2012

**Batch R164443 SampType: LCS Units mg/L**

SampID: ICV/LCS

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Sulfate	10		21	20	0	103.2	90	110	06/06/2012

**Batch R164443 SampType: MS Units mg/L**

SampID: 12060017-004BMS

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Sulfate	50	S	102	50	62.28	79.4	85	115	06/06/2012

**Batch R164443 SampType: MSD Units mg/L**

SampID: 12060017-004BMSD

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Sulfate	50	S	102	50	62.28	78.8	102.0	0.27	06/06/2012



## Quality Control Results

<http://www.teklabinc.com/>

**Client:** Barr Engineering Company

**Work Order:** 12060017

**Client Project:** Leadwood MTS-25/86-0013

**Report Date:** 18-Jun-12

### STANDARD METHOD 18TH ED. 4500-H B, LABORATORY ANALYZED

Batch	R164284	SampType:	LCS	Units	Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
					Lab pH	1.00		6.99	7.00	0	99.9	99.1	100.8	06/01/2012
Batch	R164284	SampType:	DUP	Units	Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
					Lab pH	1.00		8.05				8.030	0.25	06/01/2012
Batch	R164284	SampType:	DUP	Units	Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
					Lab pH	1.00		7.84				7.830	0.13	06/01/2012
Batch	R164284	SampType:	DUP	Units	Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
					Lab pH	1.00		7.85				7.840	0.13	06/01/2012
Batch	R164284	SampType:	DUP	Units	Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
					Lab pH	1.00		7.81				7.820	0.13	06/01/2012
Batch	R164284	SampType:	DUP	Units	Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
					Lab pH	1.00		7.78				7.770	0.13	06/01/2012

### STANDARD METHODS 18TH ED. 2340 C

Batch	R164298	SampType:	MBLK	Units mg/L	Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
					Hardness, as ( CaCO <sub>3</sub> )	5		< 5						06/01/2012
Batch	R164298	SampType:	LCS	Units mg/L	Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
					Hardness, as ( CaCO <sub>3</sub> )	5		1020	1000	0	102.0	90	110	06/01/2012

# Quality Control Results

<http://www.teklabinc.com/>
**Client:** Barr Engineering Company

**Work Order:** 12060017

**Client Project:** Leadwood MTS-25/86-0013

**Report Date:** 18-Jun-12

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**STANDARD METHODS 18TH ED. 2340 C**


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**Batch R164298 SampType: MS**      Units mg/L

SampID: 12060017-005BMS

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Hardness, as ( CaCO <sub>3</sub> )	5		700	400	300.0	100.0	85	115	06/01/2012

**Batch R164298 SampType: MSD**      Units mg/L

SampID: 12060017-005BMSD

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Hardness, as ( CaCO <sub>3</sub> )	5		700	400	300.0	100.0	700.0	0.00	06/01/2012

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**STANDARD METHODS 18TH ED. 2540 D**


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**Batch R164280 SampType: MBLK**      Units mg/L

SampID: MBLK

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Total Suspended Solids	6		< 6						06/01/2012
Total Suspended Solids	6.00		< 6.00						06/01/2012

**Batch R164280 SampType: LCS**      Units mg/L

SampID: LCS

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Total Suspended Solids	6		96	100	0	96.0	85	115	06/01/2012
Total Suspended Solids	6		104	100	0	104.0	85	115	06/01/2012
Total Suspended Solids	6		102	100	0	102.0	85	115	06/01/2012
Total Suspended Solids	6		91	100	0	91.0	85	115	06/01/2012

**Batch R164280 SampType: DUP**      Units mg/L

SampID: 12060017-004A DUP

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Total Suspended Solids	6		< 6				6.000	0.00	06/01/2012

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**STANDARD METHODS 18TH ED. 5310 C, ORGANIC CARBON**


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**Batch R164375 SampType: MBLK**      Units mg/L

SampID: ICB/MBLK

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Total Organic Carbon (TOC)	1.0		< 1.0						06/04/2012

**Batch R164375 SampType: LCS**      Units mg/L

SampID: ICV/LCS

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Total Organic Carbon (TOC)	5.0		47.2	48.2	0	98.0	89.6	109.5	06/04/2012

**Batch R164375 SampType: MS**      Units mg/L

SampID: 12060017-001EMS

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Total Organic Carbon (TOC)	1.0		7.4	5.0	2.760	93.6	80	120	06/04/2012



## Quality Control Results

<http://www.teklabinc.com/>

Client: Barr Engineering Company

Client Project: Leadwood MTS-25/86-0013

Work Order: 12060017

Report Date: 18-Jun-12

### STANDARD METHODS 18TH ED. 5310 C, ORGANIC CARBON

Batch	R164375	SampType:	MSD	Units	mg/L	RPD Limit 15			Date	Analyzed	
SampID:	12060017-001EMSD	Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	
Total Organic Carbon (TOC)			1.0		7.4	5.0	2.760	92.8	7.440	0.54	06/04/2012

### Batch R164375 SampType: MS Units mg/L

SampID:	12060017-004EMS	Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date	Analyzed
Total Organic Carbon (TOC)			1.0		6.6	5.0	1.800	95.4	80	120	06/04/2012	

### Batch R164375 SampType: MSD Units mg/L

SampID:	12060017-004EMSD	Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date	Analyzed
Total Organic Carbon (TOC)			1.0		6.8	5.0	1.800	99.2	6.570	2.85	06/04/2012	

### EPA 600 4.1.1, 200.7R4.4, METALS BY ICP (DISSOLVED)

Batch	78596	SampType:	MBLK	Units	µg/L	RPD Limit 15			Date	Analyzed		
SampID:	MB-78596	Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date	Analyzed
Cadmium			2.00		< 2.00	2.00	0	0	-100	100	06/01/2012	
Zinc			10.0		< 10.0	10.0	0	0	-100	100	06/01/2012	

### Batch 78596 SampType: LCS Units µg/L

SampID:	LCS-78596	Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date	Analyzed
Cadmium			2.00		46.3	50.0	0	92.6	85	115	06/01/2012	
Zinc			10.0		487	500	0	97.4	85	115	06/01/2012	

### Batch 78596 SampType: MS Units µg/L

SampID:	12060017-002DMS	Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date	Analyzed
Cadmium			2.00		44.2	50.0	0.9	86.6	75	125	06/05/2012	
Zinc			10.0		3180	500	2804	76.0	75	125	06/05/2012	

### Batch 78596 SampType: MSD Units µg/L

SampID:	12060017-002DMSD	Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date	Analyzed
Cadmium			2.00		44.9	50.0	0.9	88.0	44.2	1.57	06/05/2012	
Zinc			10.0		3210	500	2804	80.8	3184	0.75	06/05/2012	

### Batch 78884 SampType: MBLK Units µg/L

SampID:	MB-78884	Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date	Analyzed
Cadmium			2.00		< 2.00	2.00	0	0	-100	100	06/12/2012	
Zinc			10.0		< 10.0	10.0	0	0	-100	100	06/12/2012	

## Quality Control Results

<http://www.teklabinc.com/>

**Client:** Barr Engineering Company

**Work Order:** 12060017

**Client Project:** Leadwood MTS-25/86-0013

**Report Date:** 18-Jun-12

### EPA 600 4.1.1, 200.7R4.4, METALS BY ICP (DISSOLVED)

Batch	78884	SampType:	LCS	Units	µg/L					Date	
SampID:	78884										
Analyses											Analyzed
Cadmium		RL	Qual	Result	Spike	SPK	Ref Val	%REC	Low Limit	High Limit	
Cadmium		2.00		47.1	50.0	0	94.2		85	115	06/12/2012
Zinc		10.0		495	500	0	99.1		85	115	06/12/2012

### Batch 78884 SampType: MS Units µg/L

Batch	78884	SampType:	MS	Units	µg/L					Date	
SampID:	12060017-008BMS										
Analyses											Analyzed
Cadmium		RL	Qual	Result	Spike	SPK	Ref Val	%REC	Low Limit	High Limit	
Cadmium		2.00		48.7	50.0	3	91.4		75	125	06/12/2012
Zinc		10.0		3300	500	2877	85.2		75	125	06/12/2012

### Batch 78884 SampType: MSD Units µg/L

Batch	78884	SampType:	MSD	Units	µg/L					RPD Limit	
SampID:	12060017-008BMSD									20	
Analyses											RPD Limit
Cadmium		RL	Qual	Result	Spike	SPK	Ref Val	%REC	RPD Ref Val	%RPD	
Cadmium		2.00		48.9	50.0	3	91.8		48.7	0.41	06/12/2012
Zinc		10.0		3280	500	2877	81.0		3303	0.64	06/12/2012

### EPA 600 4.1.4, 200.7R4.4, METALS BY ICP (TOTAL)

Batch	78614	SampType:	MBLK	Units	µg/L					Date	
SampID:	78614										
Analyses											Analyzed
Cadmium		RL	Qual	Result	Spike	SPK	Ref Val	%REC	Low Limit	High Limit	
Cadmium		2.00		< 2.00	2.00	0	0		-100	100	06/04/2012
Zinc		10.0		< 10.0	10.0	0	0		-100	100	06/04/2012

### Batch 78614 SampType: LCS Units µg/L

Batch	78614	SampType:	LCS	Units	µg/L					Date	
SampID:	78614										
Analyses											Analyzed
Cadmium		RL	Qual	Result	Spike	SPK	Ref Val	%REC	Low Limit	High Limit	
Cadmium		2.00		49.7	50.0	0	99.4		85	115	06/04/2012
Zinc		10.0		511	500	0	102.2		85	115	06/04/2012

### Batch 78614 SampType: MS Units µg/L

Batch	78614	SampType:	MS	Units	µg/L					Date	
SampID:	12060017-002CMS										
Analyses											Analyzed
Cadmium		RL	Qual	Result	Spike	SPK	Ref Val	%REC	Low Limit	High Limit	
Cadmium		2.00		48.3	50.0	3.5	89.6		75	125	06/05/2012
Zinc		10.0		3760	500	3381	75.6		75	125	06/05/2012

### Batch 78614 SampType: MSD Units µg/L

Batch	78614	SampType:	MSD	Units	µg/L					Date	
SampID:	12060017-002CMSD										
Analyses											Analyzed
Cadmium		RL	Qual	Result	Spike	SPK	Ref Val	%REC	RPD Ref Val	%RPD	
Cadmium		2.00		49.5	50.0	3.5	92.0		48.3	2.45	06/05/2012
Zinc		10.0		3880	500	3381	99.4		3759	3.12	06/05/2012



## Quality Control Results

<http://www.teklabinc.com/>

Client: Barr Engineering Company

Client Project: Leadwood MTS-25/86-0013

Work Order: 12060017

Report Date: 18-Jun-12

### EPA 600 4.1.4, 200.7R4.4, METALS BY ICP (TOTAL)

Batch 78881 SampType: MBLK Units µg/L

SampID: MB-78881

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Cadmium	2.00		< 2.00	2.00	0	0	-100	100	06/12/2012
Zinc	10.0		< 10.0	10.0	0	0	-100	100	06/12/2012

Batch 78881 SampType: LCS Units µg/L

SampID: LCS-78881

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Cadmium	2.00		50.8	50.0	0	101.6	85	115	06/12/2012
Zinc	10.0		535	500	0	107.1	85	115	06/12/2012

Batch 78881 SampType: MS Units µg/L

SampID: 12060017-008AMS

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Cadmium	2.00		51.6	50.0	3.2	96.8	75	125	06/12/2012
Zinc	10.0		3490	500	3058	86.4	75	125	06/12/2012

Batch 78881 SampType: MSD Units µg/L

SampID: 12060017-008AMSD

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Cadmium	2.00		52.5	50.0	3.2	98.6	51.6	1.73	06/12/2012
Zinc	10.0		3520	500	3058	92.6	3490	0.88	06/12/2012

### STANDARD METHODS 18TH ED. 3030 B, 3113 B, METALS BY GFAA (DISSOLVED)

Batch 78595 SampType: MBLK Units µg/L

SampID: MB-78595

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Lead	2.00		< 2.00	2.00	0	0	-100	100	06/01/2012

Batch 78595 SampType: LCS Units µg/L

SampID: LCS-78595

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Lead	2.00		14.4	15.0	0	96.1	85	115	06/01/2012

Batch 78595 SampType: MS Units µg/L

SampID: 12060017-001DMS

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Lead	2.00		19.0	15.0	6.5162	83.5	70	130	06/01/2012

Batch 78595 SampType: MSD Units µg/L

SampID: 12060017-001DMSD

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lead	2.00		18.9	15.0	6.5162	82.6	19.0393	0.67	06/01/2012



## Quality Control Results

<http://www.teklabinc.com/>

**Client:** Barr Engineering Company

**Work Order:** 12060017

**Client Project:** Leadwood MTS-25/86-0013

**Report Date:** 18-Jun-12

### STANDARD METHODS 18TH ED. 3030 B, 3113 B, METALS BY GFAA (DISSOLVED)

Batch	78883	SampType:	MBLK	Units	µg/L					Date	Analyzed	
SampID:	MB-78883											
Analyses		RL	Qual			Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	
Lead		2.00				< 2.00	2.00	0	0	-100	100	06/12/2012

Batch	78883	SampType:	LCS	Units	µg/L					Date	Analyzed	
SampID:	LCS-78883											
Analyses		RL	Qual			Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	
Lead		2.00				13.5	15.0	0	90.1	85	115	06/12/2012

Batch	78883	SampType:	MS	Units	µg/L					Date	Analyzed	
SampID:	12060017-008BMS											
Analyses		RL	Qual			Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	
Lead		2.00				20.7	15.0	5.7415	99.7	70	130	06/12/2012

Batch	78883	SampType:	MSD	Units	µg/L					RPD Limit	20	
SampID:	12060017-008BMSD											
Analyses		RL	Qual			Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	
Lead		2.00				20.5	15.0	5.7415	98.6	20.7001	0.82	06/12/2012

STANDARD METHODS 18TH ED. 3030 E, 3113 B, METALS BY GFAA												
Batch	78613	SampType:	MBLK	Units	µg/L					Date	Analyzed	
SampID:	MB-78613											
Analyses		RL	Qual			Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	06/04/2012
Lead		2.00				< 2.00	2.00	0	0	-100	100	

Batch	78613	SampType:	LCS	Units	µg/L					Date	Analyzed	
SampID:	LCS-78613											
Analyses		RL	Qual			Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	
Lead		2.00				17.0	15.0	0	113.4	85	115	06/04/2012

Batch	78613	SampType:	MS	Units	µg/L					Date	Analyzed	
SampID:	12060017-001CMS											
Analyses		RL	Qual			Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	
Lead		2.00				35.1	15.0	21.159	93.1	70	130	06/04/2012

Batch	78613	SampType:	MSD	Units	µg/L					RPD Limit	20	
SampID:	12060017-001CMSD											
Analyses		RL	Qual			Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	
Lead		2.00				35.2	15.0	21.159	93.5	35.1207	0.16	06/04/2012



## Quality Control Results

<http://www.teklabinc.com/>

**Client:** Barr Engineering Company

**Work Order:** 12060017

**Client Project:** Leadwood MTS-25/86-0013

**Report Date:** 18-Jun-12

### STANDARD METHODS 18TH ED. 3030 E, 3113 B, METALS BY GFAA

**Batch 78880 SampType: MBLK Units µg/L**

SampID: MB-78880

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Lead	2.00		< 2.00	2.00	0	0	-100	100	06/12/2012

**Batch 78880 SampType: LCS Units µg/L**

SampID: LCS-78880

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Lead	2.00		13.2	15.0	0	88.2	85	115	06/12/2012

**Batch 78880 SampType: MS Units µg/L**

SampID: 12060017-008AMS

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Lead	2.00		21.2	15.0	8.4649	84.8	70	130	06/12/2012

**Batch 78880 SampType: MSD Units µg/L**

SampID: 12060017-008AMSD

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lead	2.00		21.6	15.0	8.4649	87.3	21.1901	1.75	06/12/2012



## Receiving Check List

<http://www.teklabinc.com/>

Client: Barr Engineering Company

Work Order: 12060017

Client Project: Leadwood MTS-25/86-0013

Report Date: 18-Jun-12

Carrier: Ricky Schmidt

Received By: JMH

Completed by:

On:

01-Jun-12

Timothy W. Mathis

Reviewed by:

On:

01-Jun-12

Michael L. Austin

Pages to follow:

Chain of custody

1

Extra pages included

0

Shipping container/cooler in good condition?

Yes

No

Not Present

Temp °C 0.6

Blue Ice

Dry Ice

Type of thermal preservation?

None

Ice

Chain of custody present?

Yes

No

Chain of custody signed when relinquished and received?

Yes

No

Chain of custody agrees with sample labels?

Yes

No

Samples in proper container/bottle?

Yes

No

Sample containers intact?

Yes

No

Sufficient sample volume for indicated test?

Yes

No

All samples received within holding time?

Yes

No

Reported field parameters measured:

Field

Lab

NA

Container/Temp Blank temperature in compliance?

Yes

No

*When thermal preservation is required, samples are compliant with a temperature between 0.1°C - 6.0°C, or when samples are received on ice the same day as collected.*

Water – at least one vial per sample has zero headspace?

Yes

No

No VOA vials

Water - TOX containers have zero headspace?

Yes

No

No TOX containers

Water - pH acceptable upon receipt?

Yes

No

Any No responses must be detailed below or on the COC.

Custody seal(s) intact on shipping container/cooler.

Print Form

## Teklab Chain of Custody

Pg. 1 of 1 Workorder 12060017

5445 Horseshoe Lake Road ~ Collinsville, IL 62234 ~ Phone: (618)344-1004 ~ Fax(618)344-1005

Barr Engineering Co.

Are the samples chilled?  Yes  No with:  Ice  Blue IcePreserved in  Lab  Field

KL 6/1/12

1001 Diamond Ridge, Suite 1100

Cooler Temp 06 Sampler Chris Schulte

Jefferson City

MO

65109

Comments

Invoice to Mark Nations. Results to Allison Olds and Mark Nations, mnations@doerun.com  
Matrix is surface water.

Leadwood MTS - 25/86-0013

Metals = Cd, Pb, Zn *Custody seal intact RS 6-1-12*

Contact Allison Olds

eMail aolds@barr.com

Phone 573-638-5007

Requested Due Date Standard

Billing/PO Per contract with Doe Run

Lab Use	Sample ID	Sample Date/Time	Preservative Matrix	pH	T.S.	Sulfate	Settleable Solids	T.O.C.	Total Metals	Dissolved Metals	Hardness				
12060017 001	LW-001	5-31-12 / 1320	Unpres 5	Aqueous	<input checked="" type="checkbox"/>										
002	LW-002		12:35	Unpres 5	Aqueous	<input checked="" type="checkbox"/>									
003	LW-Dup		12:45	Unpres 5	Aqueous	<input checked="" type="checkbox"/>									
004	LW-DS		9:30	Unpres 5	Aqueous	<input checked="" type="checkbox"/>									
005	LW-US		9:30	Unpres 5	Aqueous	<input checked="" type="checkbox"/>									
			Unpres	Aqueous	<input type="checkbox"/>										
			Unpres	Aqueous	<input type="checkbox"/>										
			Unpres	Aqueous	<input type="checkbox"/>										

*Teklab Inc.  
Carrier Pick Up*

Relinquished By *	Date/Time	Received By	Date/Time
Chris Schulte / Barr R. Schulte	5-31-12 / 16:00 6/1/12 11:00	R. Schulte Chris Schulte	6/1/12 08:30 6/1/12 11:00

\* The individual signing this agreement on behalf of client acknowledges that they have read and understand the terms of this agreement and that they have the authority to sign on behalf of client.